

In response, the Examiner's attention is directed to the disclosure on page 8, lines 4-7, which states (with emphasis added):

"All compositions were obtained by **premixing the components in the solid phase** and subsequently feeding them to a twin-screw extruder and mixing them using a temperature profile of 150 to 260 °C."

This disclosure provides explicit written description for "comprising melt mixing a solid matrix polymer A with a solid comprising said rubber composition dispersed in a matrix polymer B ..." and, therefore, satisfies the written description requirement of the first paragraph of 35 USC 112.

Accordingly, withdrawal of this rejection is respectfully requested.

Claims 14-18, 20, 21, 24 and 27 stand rejected under 35 USC 102(b) or 35 USC 103(a) as anticipated or obvious in view of US 5,889,112 (US 112) to Shih, *et al.*

Applicants respectfully disagree and traverse this rejection for at least the following reasons.

These claims are categorized as "product-by-process" type claims. It is, however, respectfully submitted that this characterization does not apply to most of the rejected claims.

Claim 27 defines the composition in terms of structure and ingredients without reference to a method for production. The dispersed rubber composition consists of a functionalized rubber and a non-functionalized rubber. The functionalized rubber is derived from a rubber that is the same as that of the non-functionalized rubber. The composition may further (optionally) include one or more additives or auxiliary materials. The composition is further defined by having the property of being mixable with a composition comprising a second matrix polymer to form an impact-resistant polymer composition. The claim also notes that the functionalized rubber contains groups that can react with either or both of the first and second matrix polymers. Accordingly, it is respectfully submitted that the characterization of claim 27 as product-by-process format is incorrect.

Since there is no evidence that the compositions of US 112 include a dispersed rubber composition in a first polymer matrix wherein the dispersed rubber consists of a non-functionalized rubber and a functionalized rubber derived from the same rubber as that of the non-functionalized rubber, at least the rejection of claim 27 should be withdrawn.

Substantially the same consideration applies to claim 15. In claim 15 it is stated that "at least one of the functionalized rubber and/or the non-functionalized rubber comprises ethylene- $\alpha$ -olefin copolymer obtained by polymerization in the presence of a metallocene catalyst." It is respectfully submitted, however, that claim 15 should not be considered to be

in product-by-process format even if one ingredient in the composition is defined, in part, by its method of production, namely, polymerization in the presence of a metallocene catalyst. Otherwise, this claim also defines the claimed granule mixture in terms of components and structure.

Since claims 16-18 and 24 depend from claim 15, these claims also should not be characterized as being in product-by-process format.

In the case of claim 15, US 112 does not disclose a granule mixture in which there is a functionalized and/or non-functionalized ethylene- $\alpha$ -olefin copolymer obtained by polymerization in the presence of a metallocene catalyst. At a minimum, therefore, the rejection of claim 15 as anticipated by US 112 should be withdrawn.

Additionally, however, since there is neither disclosure nor suggestion in US 112 of a granule mixture comprising any type of copolymer prepared using a metallocene catalyst one skilled in the art would not have been motivated to modify the disclosure of US 112 to arrive at the subject matter set forth in claim 15. All that is disclosed in US 112 is elastomeric ethylene-propylene dipolymer or ethylene-propylene diene terpolymer; there is no disclosure of the plastomeric metallocene catalyzed polymers nor would the improved creep properties demonstrated in the examples of this application (compare Compositions 8, 10 and 13 with Composition 6) have been expected from the disclosure of US 112.

Claim 24 depends from claim 15 and is patentable over US 112 for at least the same reasons as discussed above for claim 15.

With respect to claim 16, the embodiment of the invention defined by this claim is neither anticipated by nor obvious in view of US 112 since there is no disclosure of a granule mixture having two identical matrix polymers. In fact, the disclosure of US 112 is specifically directed to blending of dissimilar polymers. Therefore, claim 16 should be allowed.

Claim 17 is directed to an embodiment of the invention which is neither anticipated by nor obvious in view of US 112. Nothing in the disclosure of US 112, explicitly describes or inherently forms a granule mixture wherein a functionalized rubber is present as a shell around the core of a non-functionalized rubber. Therefore, the subject matter of claim 17 is neither anticipated nor obvious in view of US 112 and should be allowed.

In the case of claim 18, as noted above, the disclosure of US 112 does not anticipate or make obvious a granule mixture which includes a functionalized and a non-functionalized rubber comprising ethylene- $\alpha$ -olefin copolymer obtained by polymerization in the presence of a metallocene catalyst. Accordingly, allowance of claim 18 is respectfully requested.

Claims 14 and 20, which may be characterized as product-by-process claims, are neither anticipated by nor unpatentably obvious over the prior art. In this case, the patentees themselves recognize that the method, *e.g.*, all solid process versus melt-process versus staged-feeding process, of forming the composition of a mixture of dissimilar polymers having different melt viscosities, results in differences in the final products, such as the extent of fragmentation. Claim 21 additionally recites that the functionalized rubber is present as a shell around a core of non-functionalized rubber and a composition having this structure is not described by US 112. Accordingly, it is respectfully submitted that claims 14, 20 and 21 should also be allowed.

Accordingly, for the reasons stated above, the rejection of claims 14-18, 20, 21, 24 and 27, as anticipated by or obvious over US 112 to Shih *et al*, is respectfully traversed and the rejection should be withdrawn.

Claims 1-13, 19, 22, 23, 25 and 26 are rejected under 35 USC 103(a) as unpatentable over US 112.

Applicants respectfully disagree and traverse this rejection for at least the following reasons.

It appears that the basis for this rejection is that the disclosure of US 112, in its third embodiment, allegedly encompasses an **all-solid** stage feed process.

It is respectfully submitted, however, that US 112 does not disclose a process (and, in fact, can be considered to teach away from such a process) in which a solid polymer matrix A (first polymer) and a solid comprising a rubber composition, dispersed in a matrix polymer B (second polymer) are premixed and the mixture then melted as claimed herein.

The Examiner has referred to column 6, lines 16-19 as allegedly disclosing an “all-solid” stage feed process. However, what is disclosed at column 6, lines 16-19, is that when the first polymer is feed to the mixer as a solid, the second polymer may be feed downstream of, (*i.e.*, “subsequent to the first feed stage” column 6, line 17) the first polymer. Therefore, even if the second polymer is feed as a solid it will be feed to the mixer (extruder) while the first polymer is already in the molten state. In other words, there is no disclosure of premixing the solid first and second polymers and then feeding the mixture to the extruder or other melting device.

Accordingly, even the “all-solid” process disclosed at column 6, lines 16-19, does not make obvious the claimed embodiments of the present invention wherein a matrix polymer A and a composition comprising a rubber composition dispersed in a matrix polymer B are mixed while both are in the solid state (*i.e.*, wherein the matrix polymer B and the rubber

composition have previously been melt mixed to form a solid dispersion). Nowhere in the disclosure of US 112 is it disclosed or suggested to form a solid dispersion of a rubber composition in a polymer matrix and then mix the solid dispersion with another polymer matrix and thereafter melt blend the solids mixture.

With regard to claim 13, directed to a solid composition, comprising a dispersed rubber composition in a polyester, polyacetal or polycarbonate, and wherein the solid composition may be mixed with a second matrix polymer to form an impact-resistant polymer composition, the Examiner refers to the disclosure at column 4, lines 21-25, as evidence that any other polymer may be used.

Applicants respectfully disagree. What is disclosed at column 4, lines 21-25 is that different first and second polymer matrix materials may be used provided that the polymers are dissimilar. However, there is no disclosure of forming a solid composition comprising a dispersed rubber composition in a first matrix polymer and which is mixable with a composition comprising a second matrix polymer, especially where the rubber composition is one which includes a mixture of functionalized and non-functionalized rubbers.

In addition, US 112, as previously explained, does not disclose or suggest that at least one or the other or both of the rubbers is obtained by polymerization in the presence of a metallocene catalyst.

The subject matter of claim 19 is considered obvious in view of the disclosure at column 4, line 23 of US 112, wherein the patentees mention copolymers of styrene, such as styrene maleic anhydride, and functionalized styrene hydrogenated butadiene block copolymer. However, this disclosure still fails to suggest the subject matter of claim 19, considered as a whole (*i.e.*, as dependent on claim 15). That is, there is no disclosure of a granule mixture comprising a matrix polymer A and a matrix polymer B in which a rubber composition comprising a functionalized rubber and a non-functionalized rubber, at least one of which comprises styrene-butadiene block copolymer, which may be functionalized, and at least one of which also comprises an ethylene- $\alpha$ -olefin copolymer, which may also be functionalized, is dispersed.

For all of the reasons given above, it is respectfully submitted that the rejection of claims 1-13, 19, 22, 23, 25 and 26 as unpatentably obvious over US 112, to Shih *et al*, is improper and should be withdrawn.

In view of the foregoing, the claims are now believed to be in form for allowance, and such action is hereby solicited. If any point remains in issue which the Examiner feels may be best resolved through a personal or telephone interview, please contact the undersigned at the telephone number listed below.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in a condition for allowance and a Notice to that effect is earnestly solicited.

Please charge any fees associated with the submission of this paper to Deposit Account Number 03-3975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,

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